Teaching Statement

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I have strong fundamentals in all areas of mathematics and I have experienced over 20 years of teaching experience. My mathematics teaching experience is large and broad. I have taught every undergraduate and master’s course from basic to advanced. These include the basic ones: Calculus I, II, III, Business Calculus, Half-Calculus III, Probability Theory, Differential Equations, and Applied Linear Algebra; and the advanced ones: Elementary Real Analysis, Abstract Algebra, Abstract Linear Algebra, Complex Variables, Applied Complex Variables, and Differential Geometry.

I created all the course contents including exams, quizzes, homework assignments, lecture presentations, supplementary notes, course schedule, syllabus, reading schedule, etc. I designed and launched new courses. I taught all the textbook exercise problems and additional ones. I gave in-person and online office hours and referred students to additional readings for help. I graded all the HW and exams.

I am currently teaching four courses: Abstract Linear Algebra, Differential Geometry, Applied Complex Variables, and Complex Variables; and I am active in research and seminars. I have been participating in an Algebraic Number Theory Seminar, Algebraic Geometry Seminar, and Graduate Student Algebraic Geometry Seminar.

• Recent teaching including current courses.

<table>
<thead>
<tr>
<th>Course</th>
<th>Term</th>
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<tbody>
<tr>
<td>Differential Geometry</td>
<td>June 1, 2020 ~ Present</td>
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<tr>
<td>Complex Variables for Engineering Students</td>
<td>Spring 2020</td>
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<tr>
<td>Applied Complex Variables</td>
<td>Summer 2019, May 2019 ~ Present</td>
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<tr>
<td>Complex Variables</td>
<td>Summer 2018, May 2018 ~ Present</td>
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<tr>
<td>Abstract Linear Algebra</td>
<td>May 2018 ~ Present</td>
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<tr>
<td>Abstract Algebra</td>
<td>Summer 2017</td>
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<tr>
<td>Elementary Real Analysis</td>
<td>Summer 2017</td>
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• New course content development:


- 10 sets of exams each for Applied Complex Variables (Math 446) and Complex Variables (Math 448) to use for online proctored exams. I reviewed and revised them together with 10 sets of Abstract Linear Algebra exams (Math 416).

I have taught and developed courses at NetMath for 9 years (since 2012). I initiated online teaching of advanced courses including Elementary Real Analysis, Abstract Algebra,
Abstract Linear Algebra, Complex Variables, Applied Complex Variables and Differential Geometry. The courses were successful. I also created randomized exam question pools for all undergraduate courses including Calculus II, III, Business Calculus, Probability Theory, Differential Equations, and Applied Linear Algebra. For my courses each summer, and for the year-long courses, I created all the necessary contents to post on Moodle and the exams. I created lecture note presentations of (40+ lectures) for each of these courses: Elementary Real Analysis, Abstract Algebra, Abstract Linear Algebra, Complex Variables, and Applied Complex Variables (edited). I created homework assignments/solutions, course syllabi, topics for each of the lectures, course schedules, supplementary notes, etc.

I have made valuable contributions to mathematics education at the University of Illinois at Urbana-Champaign through my teaching over the past 18 years. The advanced courses that I developed are Abstract Algebra, Elementary Real Analysis, Complex Variables, Applied Complex Variables, Abstract Linear Algebra, and Differential Geometry. I developed randomized test banks of questions for Calculus II, III, Business Calculus, Differential Equations, Applied Linear Algebra, and Probability Theory using the Mathematica software. I created the Mathematica codes to randomize the numbers, functions and statements in the test banks. These test banks are currently being used to generate exams for the courses offered by NetMath.

I have given talks each semester at the Graduate-Student Algebraic Geometry Seminar on several topics including derived categories of abelian categories and applications, moduli space of algebraic curves, Zariski tangent space to the moduli space of vector bundles, complete intersections, intersection theory, and Hilbert schemes.

Teaching requires not only knowledge of the courses but also discipline acquired through experience. I have learned discipline as a math professor through my experiences in the master’s degree and PhD programs at Kyungpook National University in South Korea, in the PhD program at the University of Illinois at Urbana-Champaign, and as an adjunct professor at Governors State University.

I have enjoyed rare and special opportunities as a mathematician. I developed new courses and successfully initiated them. I have taught face-to-face and online one-on-one and online semester classes. I have taught students by both traditional and nontraditional methods. I have been a committee member of NMC (National Math Competition) and a finals judge for ICTM (Illinois Council of Teachers of Mathematics). I have participated in the Graduate-Student Algebraic Geometry Seminar, the Algebraic Geometry Seminar, and Algebraic Number Theory Seminar. I am a committee member of the KSEA math contest for which I have created 11th grade contest questions every year since 2016. I teach AMC and MATHCOUNTS to my children and their friends. I have had full-time students who are also working full-time, part-time students who are professionals, and traditional full-time students. I employ technology to teach off-campus students and working professionals. I teach them in one on one via Zoom office hours, emails, and Forum in Moodle.

Teaching philosophy is to teach quality math courses and develop a strong mathematical background in my students. My students’ goal is to complete the courses they registered for
so that they will have a solid mathematical background to draw from in their careers.

Students enjoy learning when they make a measurable progress in understanding concepts. This can be attained by discussing HW problems, examples, theorems, etc. I discuss with students one on one during virtual office hours. I make comments and give related readings when I grade homework.

I am connected to the students via technology. I give both in-class office hours and virtual office hours. I teach both semester-based courses and non-semester-based courses and in summer I teach both on- and off-campus students.

There are students with different mathematical backgrounds in my classes. I answer the same questions repeatedly and patiently until they understand.

I developed and launched six courses: Elementary Real Analysis, Abstract Algebra, Complex Variables, Applied Complex Variables, Abstract Linear Algebra, and Differential Geometry. I have received high ratings from my students.

I have taught as a TA at the University of Illinois at Urbana-Champaign, an adjunct professor at Governors State University, and a lecturer at the University of Illinois at Urbana-Champaign. At NetMath I have developed a randomized test/solution bank for all undergraduate courses, as well as developed all course contents for the six upper-level courses. Through this extensive experience I have reviewed all undergraduate and upper-level courses.

Through my 20 years of experience I have learned that teaching mathematics is challenging, rewarding and definitely enjoyable.

These are my students’ testimonies:

“Thank you for the explanation. I read through Do Carmo’s chapter on Ruled surfaces and minimal surfaces today, and feel much better about the topic.”

“Hi Jin, Thank you for your timely and helpful response throughout the course! I really appreciate it and wish you all the best in 2021!”

“Thank you for your support throughout the course!”

“I have completed all the exams of Math 416. Thanks again for your work! It is really helpful that you wrote comments in my homework!”

“I have finished my final exam of Math 446. I really appreciate that you write details about how to revise my solution for every homework and exam. Math 446 is actually a tough course for me.”

“Thank you for the feedback clarifying many of the homework problems over the last few weeks.”

“I just finished the final exam. Great to have this cool course and thank you for your grading/comments on HW!”